

6/affidavit
CP
4/22-00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: §
Alberson et al. §
Serial No.: **10/091,838** § Examiner: **MacArthur, V. L.**
Filed: **03/06/02** § Art Unit: **3679**
For: **Hybrid Energy Absorbing** §
Reusable Terminal § Attorney Docket No.: **TAM-1005-US**

The Honorable Commissioner
of Patents & Trademarks
Washington, D.C. 20231

AFFIDAVIT OF DEAN C. ALBERSON UNDER 37 CFR §1.131

County of Brazos §
§
State of Texas §

I, Dean C. Alberson, being duly sworn, depose and state:

1. I am an inventor of the subject matter of claims 1-20 of the subject patent application having serial number 10/091,838 and entitled "Hybrid Energy Absorbing Reusable Terminal." I have personal knowledge of the statements made in this Affidavit.
2. Prior to January 3, 2001, I and the other inventors named with me conceived of the idea of a reusable crash cushion or terminal having a collapsible, substantially self-restoring collapsing portion with a pair of parallel panels that are formed substantially of a thermoplastic material, such as polyethylene. We also conceived of the idea of a crash cushion having a collapsible cushion portion with a cambered panel member that collapsibly folds during a collision and, due to shape memory, will substantially return to an unfolded condition after a collision. Additionally, we conceived the idea of a roadway crash cushion having a ground-mounted longitudinal basetrack, a pair of planar

panel members with a cambered portion that promotes plastic bending of the panel member, a plurality of diaphragms that secure the panel members together and engage with the basetrack, and a tension cable. We refer to these concepts as a Hybrid Energy Absorbing Reuseable Terminal, or "HEART," for short.

3. Attached hereto at Tab A is a true and correct copy of a memorandum received by me from Terry A. Young, the executive director of the technology licensing office for the Texas A&M University System. The memorandum bears a date, which has been redacted. However, the date that was redacted is a date prior to January 3, 2001. This memorandum demonstrates conception of the HEART device at a date prior to January 3, 2001.

4. Attached hereto at Tab B is a true and correct copy of a set of conceptual drawings of a diaphragm component of the HEART device. These drawings bear a creation date, which has been redacted. However, the date that was redacted is a date prior to January 3, 2001.

5. Attached hereto at Tab C is a true and correct copy of a memorandum from me to Byron C. Blaschke, Chairman of the Intellectual Property Technical Committee of the Texas Transportation Institute of the Texas A&M University System. This memorandum bears a date, which has been redacted. However, the date that was redacted is a date prior to January 3, 2001. The memorandum also has attached drawings that depict the HEART, generally illustrating the features recited in claims 1-20 of the present patent application. Thus, the memorandum attached at Tab C also demonstrates conception of the claimed invention at a date prior to January 3, 2001.

6. The memorandum attached at Tab C also outlines a "Work Plan" for development and testing of the HEART. The steps of the plan include "Complete Initial Design," "Component Level Testing," "Simulate Conceptual Design," and "Fabricate Prototype." As a result, the memorandum also demonstrates that the inventors were working from conception toward a reduction of the

invention to practice, at least through testing and construction of a prototype. I prepared and submitted the memorandum attached at Tab C in order to have funding approved for development and testing of a prototype HEART device. Funding was later approved for this work to be done.

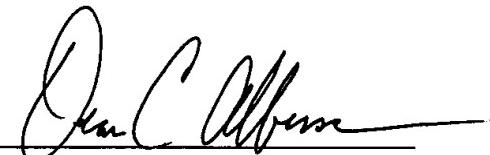
7. I and the other inventors then began to follow the work plan and to develop and test a prototype of the HEART device. Development and testing was pursued diligently at all times from conception to actual construction of the prototype.

8. A prototype of the HEART device was constructed by late 2001 and tested at the Texas A&M University's Riverside Campus testing facilities.

9. Attached at Tab D is a true and correct copy of a set of drawings of portions of the prototype HEART device that were prepared during July 2001. Attached at Tab E is a true and correct copy of further drawings of the prototype device that were prepared during October 2001. As is apparent from the drawings attached at Tabs D and E, the HEART prototype included the features recited in claims 1-20 of the present application.

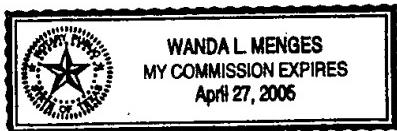
10. As evidenced by the memorandum attached at Tab A, the HEART concept was disclosed to the Texas A&M University System on a date prior to January 3, 2001 so that the University System could consider whether a patent application should be prepared. The present application was filed on March 6, 2002.

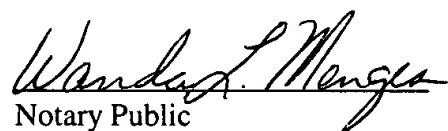
11. Further Affiant sayeth not.



Dean C. Alberson

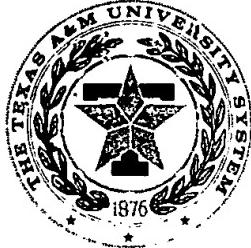
Sworn to and subscribed before me on the 26th day of March, 2003.





Wanda L. Menges
Notary Public

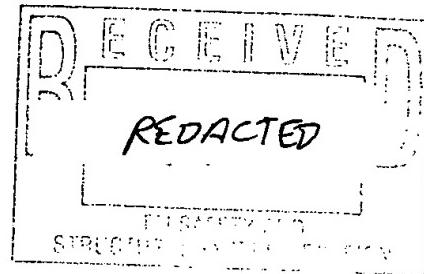
EXHIBIT A



The Texas A&M University System

Technology Licensing Office

3369 TAMU • College Station, Texas 77843-3369
Phone (979) 847-8682 • Fax (979) 845-1402 • <http://TLO.tamu.edu>



MEMORANDUM

TO: Dean Alberson
Associate Research Engineer
TTI Safety & Structural Systems Department

FROM: Terry A. Young
Executive Director
Technology Licensing Office

DATE: *TAY/SLB*

SUBJECT: *REDACTED*
TAMUS Disclosure of Invention 1634TTI00 - "Hybrid Energy Absorbing Reusable Terminal"

Please accept my personal congratulations for the referenced disclosure submitted to the Technology Licensing Office of The Texas A&M University System. Development of innovative intellectual property required extraordinary effort and creativity. And, we appreciate the additional concern you demonstrated to document and disclose the invention to the System.

The transfer of research results to commercial application plays a significant role in the mission of The Texas A&M University System through service and benefit to the public and enhancement of the growth and diversification of the State of Texas. We appreciate your participation with us in this effort, and trust that we will be diligent in management of this intellectual property.

TAY/slb

xc: H. H. Richardson
G. Butch
B. Blaschke
D. W. Bugh
C. V. Wootan
S. L. Burr

Universities

Prairie View A&M University • Tarleton State University • Texas A&M International University • Texas A&M University • Texas A&M University-Commerce • Texas A&M University-Corpus Christi
Texas A&M University-Kingsville • Texas A&M University-Texarkana • West Texas A&M University

Agencies

Texas Agricultural Experiment Station • Texas Agricultural Extension Service • Texas Engineering Experiment Station • Texas Engineering Extension Service • Texas Forest Service
Texas Transportation Institute • Texas Veterinary Medical Diagnostic Laboratory • Texas Wildlife Damage Management Service

EXHIBIT B

SOLIDS

Mass: 103.79 lb
Volume: 366.02014 cu in
Bounding box:
X: 0.00000 --- 25.50000 in
Y: 0.00000 --- 39.00000 in
Z: -2.00000 --- 0.25000 in
Centroid:
X: 12.74663 in
Y: 18.50589 in
Z: -0.81551 in

Moments of inertia:

X: 190055.14247 lb sq in
Y: 87502.16301 lb sq in
Z: 276674.15300 lb sq in
Products of inertia:
XY: 863336.55628 lb sq in
YZ: -5728.43039 lb sq in
ZX: -3805.92599 lb sq in
Radii of gyration:
X: 22.78701 in
Y: 15.46169 in
Z: 27.49361 in

Principal moments (lb sq in) and X-Y-Z directions about centroid:

I: 64461.59033 along [1.00000 0.00008 -0.00004]
J: 27788.36408 along [-0.00008 0.99999 -0.00319]
K: 91854.95288 along [0.00004 0.00319 0.99999]

The Texas A&M University System

| Revision | | | Texas Transportation Institute | | |
|-------------------|------|----|--------------------------------|---------|-----------|
| No. | Date | By | COLLEGE STATION, TEXAS 77843 | | |
| 1. | | | Project No. | Date | Drawn By |
| 2. | | | 220581 | RESPORT | Scale |
| 3. | | | | BAS | |
| 4. | | | | | Sheet No. |
| 5. | | | | | 1 |
| MECHANICAL DETAIL | | | DIAPHRAGM DETAIL | | |

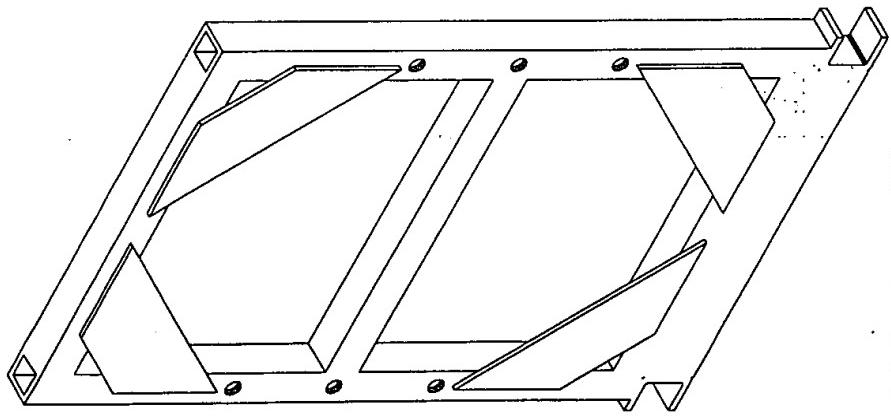


EXHIBIT C

COPY



REDACTED

MEMORANDUM

TO: Mr. Byron C. Blaschke, Chairman
Intellectual Property Technical Committee
NCA *DLB* *CK*

FROM: Dean C. Alberson, D. Lance Bullard, Jr., and Christopher J. Karpathy

SUBJECT: Hybrid Energy Absorbing Reusable Terminal

Reusable and largely self-restoring crash cushions are gaining acceptance with highway safety engineers. We have a conceptual design of a product in conjunction with John F. Carney, III of Worcester Polytechnic Institute, the inventor of the REACT Crash Cushion, for a crash cushion fabricated with thermal plastic sheeting and steel diaphragms atop a steel undercarriage. (See Attachment)

The four (4) inventors, Dean C. Alberson, D. Lance Bullard, Jr., Christopher J. Karpathy, and John F. Carney, III, have all been involved in the design and crash testing of crash cushions. We are intimately knowledgeable of both the positive aspects and deficiencies of crash cushions. We believe this new cushion will address these issues and provide an extremely marketable product.

OBJECTIVE

The objective is to simulate the Hybrid Energy Absorbing Reusable Terminal using LS-DYNA, test the product to *NCHRP Report 350*, and have a licensee market the product.

WORK PLAN

- Complete Initial Design
- Component Level Testing
- Simulate Conceptual Designs (Akram Abu-Odeh and/or Grad Student)
- Fabricate Prototype

Texas
Transportation
Institute

The Texas A&M
University System

3135 TAMUS
College Station, TX
77843-3135

979-845-6375
979-845-6107
<http://tti.tamu.edu>

Byron C. Blaschke, Chairman

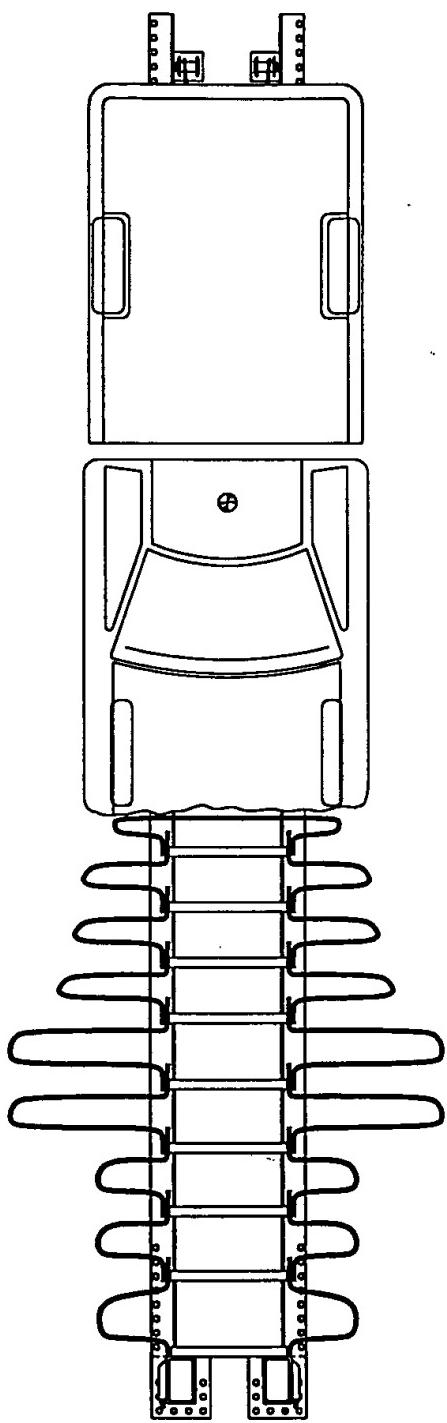
-2-

REDACTED

COST ESTIMATES

| | |
|---|----------|
| Complete Initial Design and Component Level Testing | \$10,000 |
| Computer Simulations | \$25,000 |
| Test Article Fabrication | \$10,000 |
| <hr/> | |
| Total | \$45,000 |

Attachments



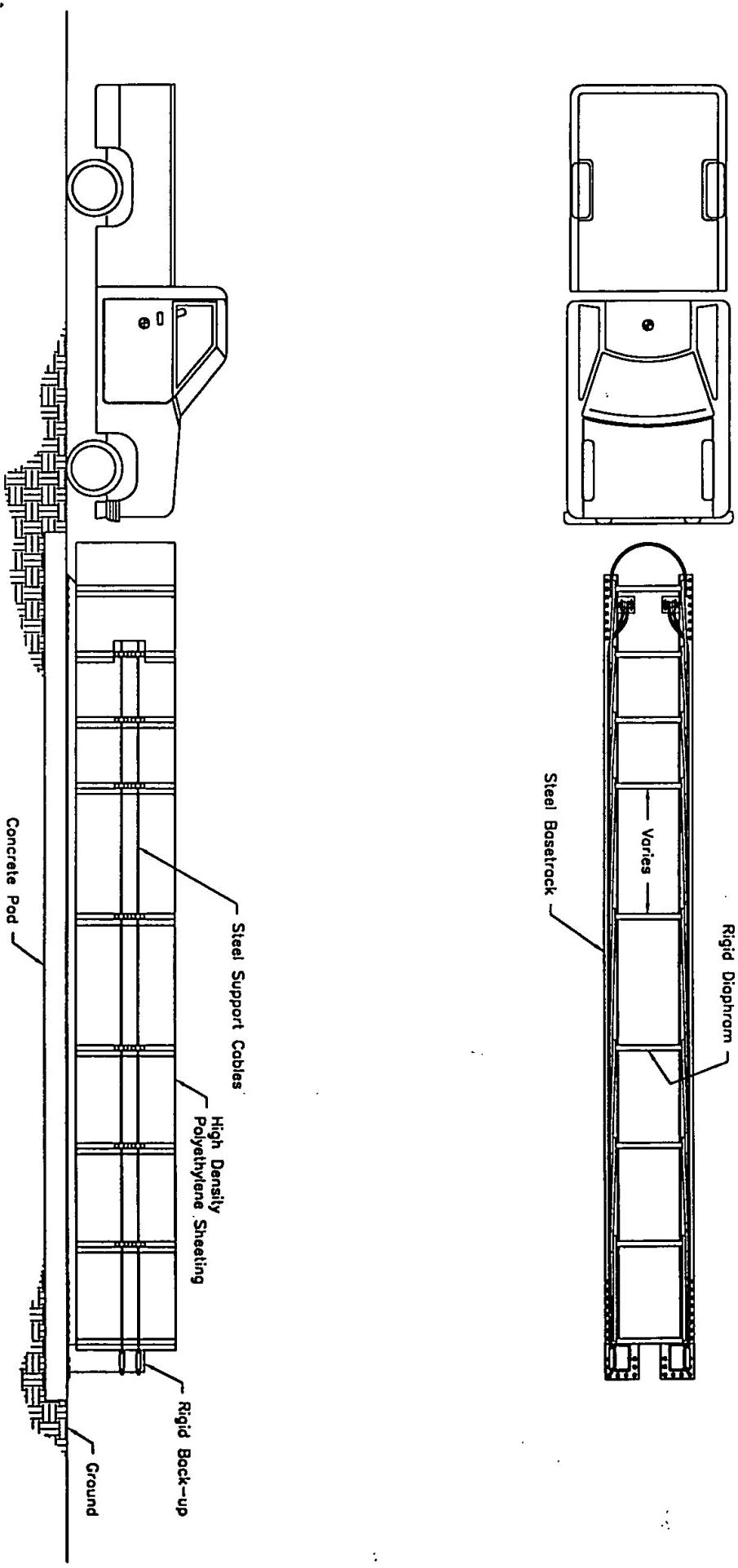
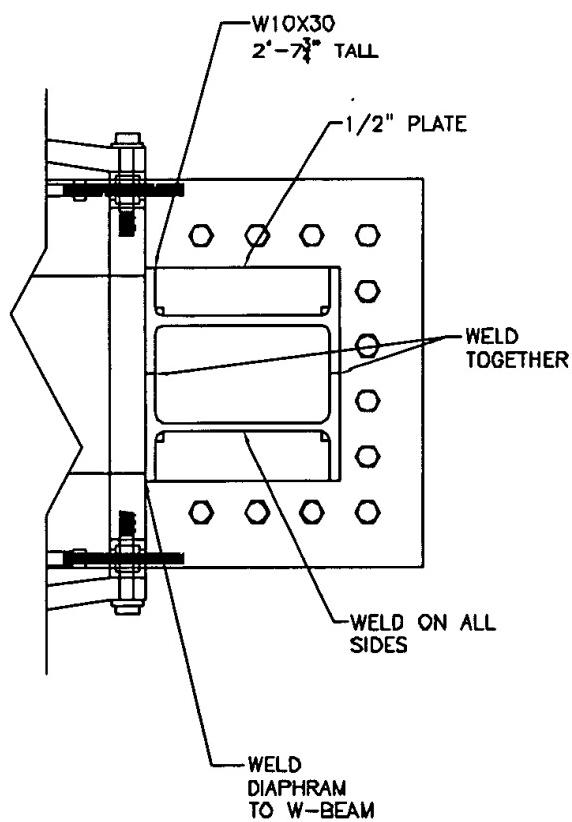
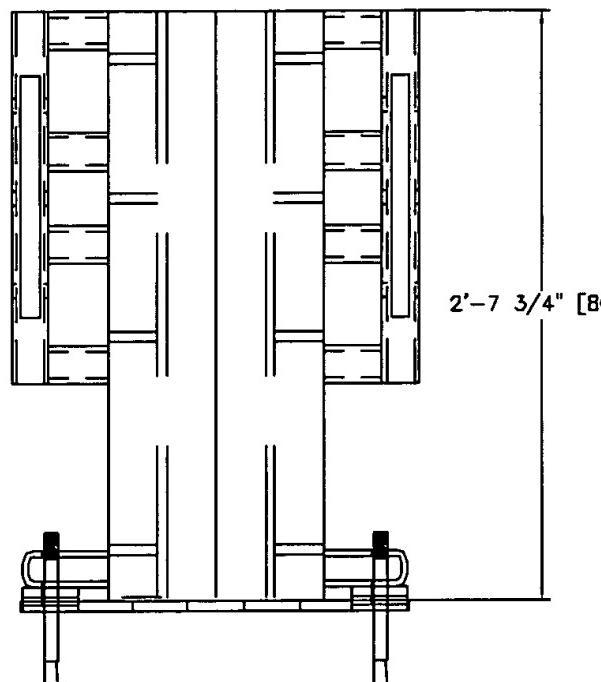
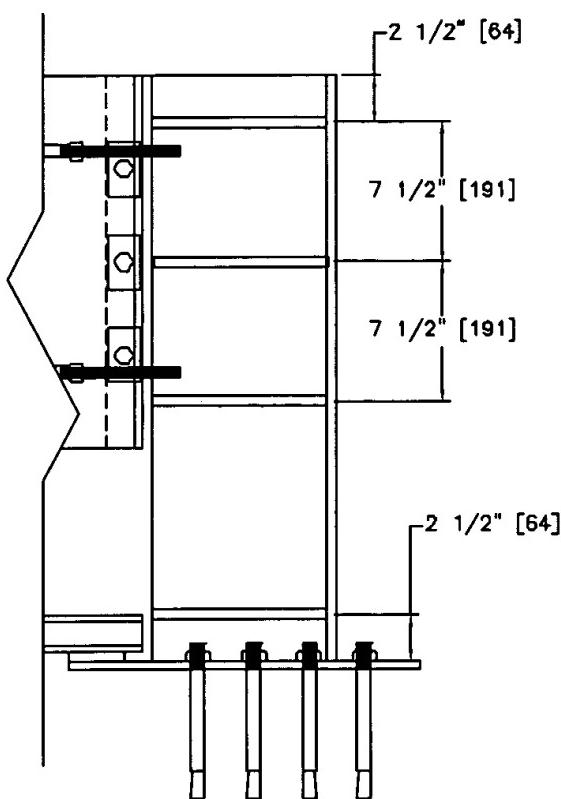
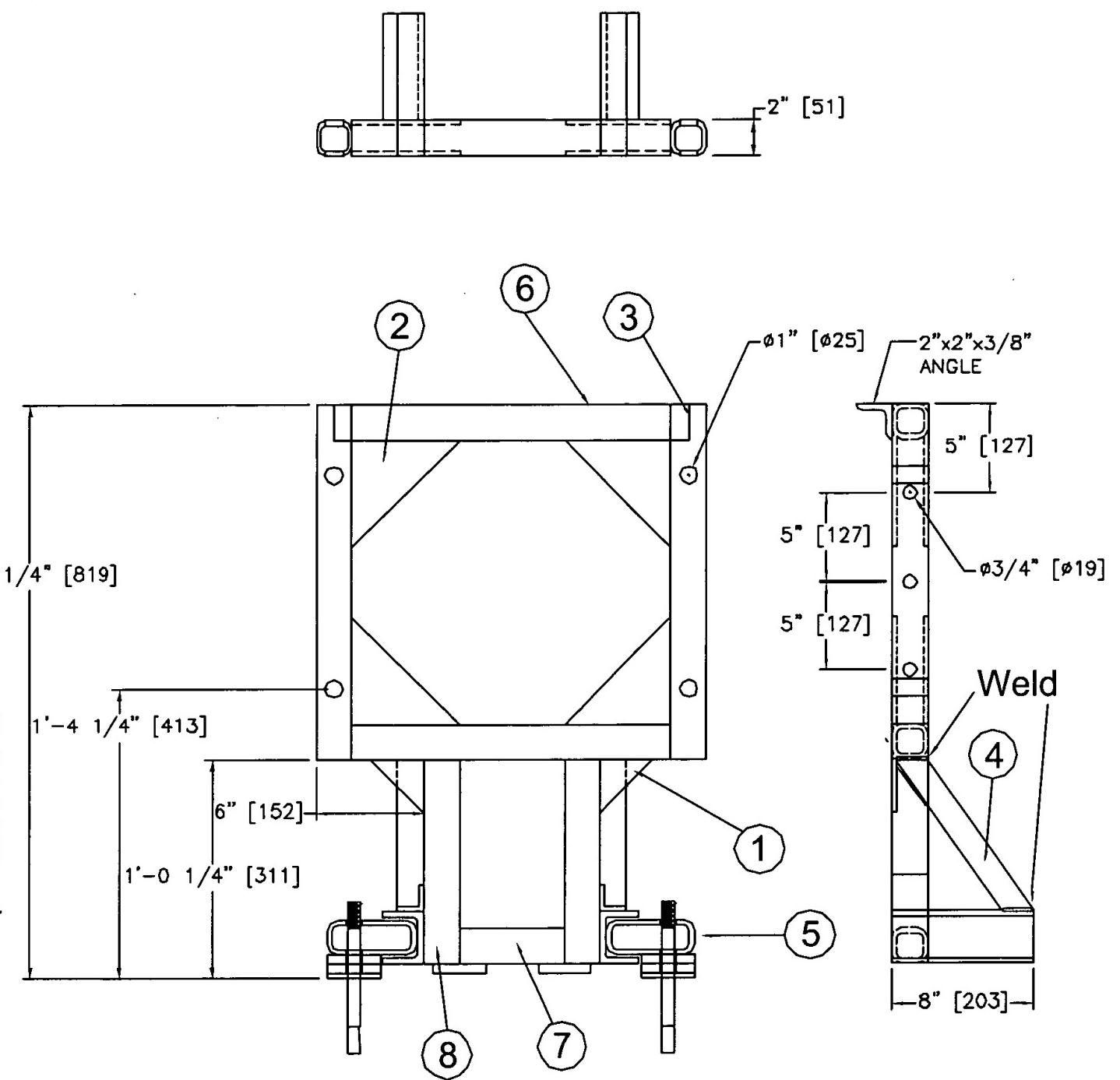


EXHIBIT D



| Revisions | | | The Texas A&M University System TEXAS TRANSPORTATION INSTITUTE COLLEGE STATION, TEXAS 77843 | | | |
|-----------|------|----|---|-------|---------------------|-------|
| No. | Date | By | Project No. | Date | Drawn By | Scale |
| 1. | | | 220581 | 07/01 | BAS | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| | | | BACKUP STRUCTURE | | Sheet No. 1 of 1 | |

Jan 24, 2002 - 11:32am



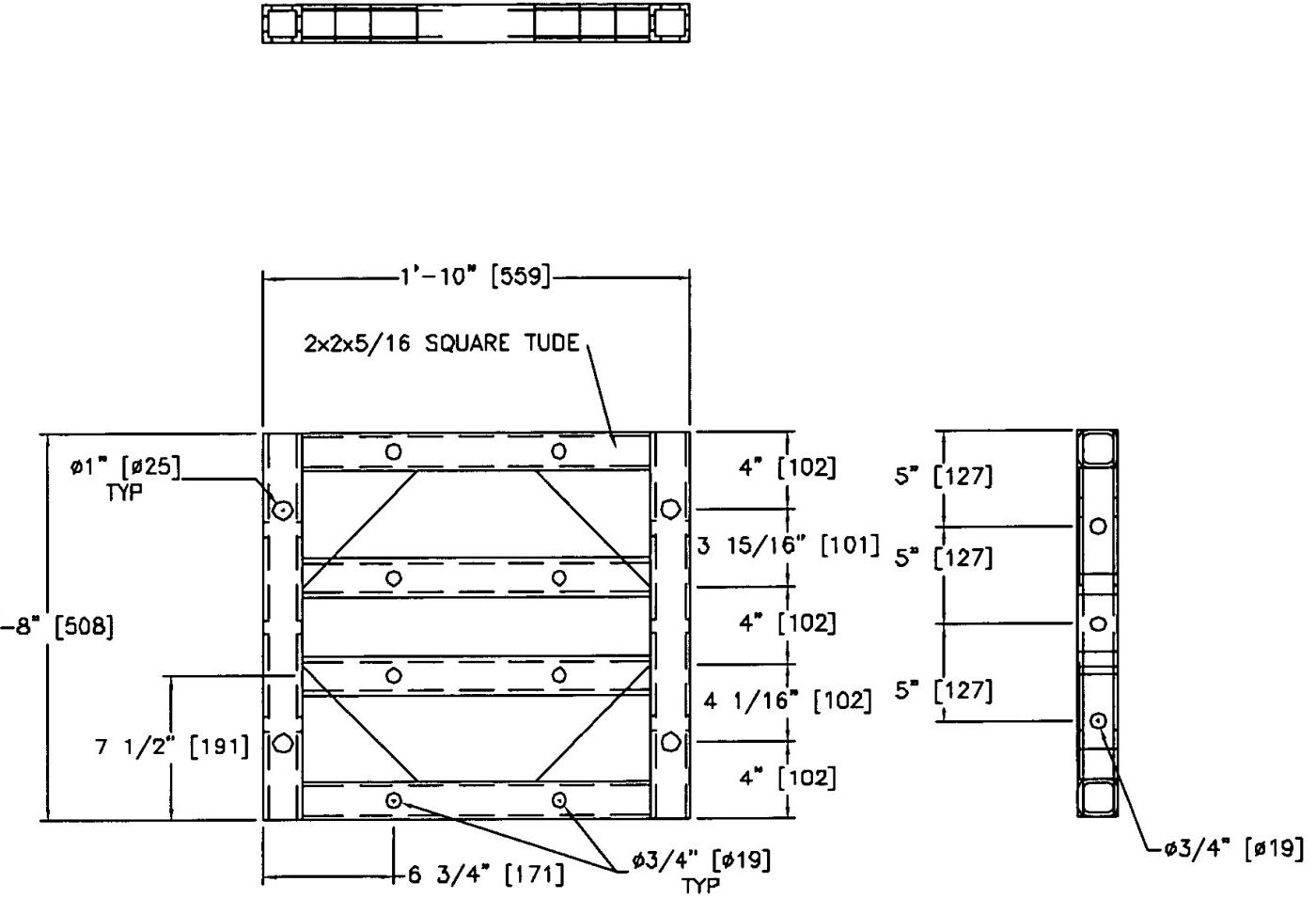
#1 DIAPHRAM

The Texas A&M University System

| Revisions | | | TEXAS TRANSPORTATION INSTITUTE COLLEGE STATION, TEXAS 77843 | | | |
|-----------|------|----|--|-------|----------|-------|
| No. | Date | By | Project No. | Date | Drawn By | Scale |
| 1. | | | 220581 | 11/01 | CRM | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |

DIAPHRAM DETAILS

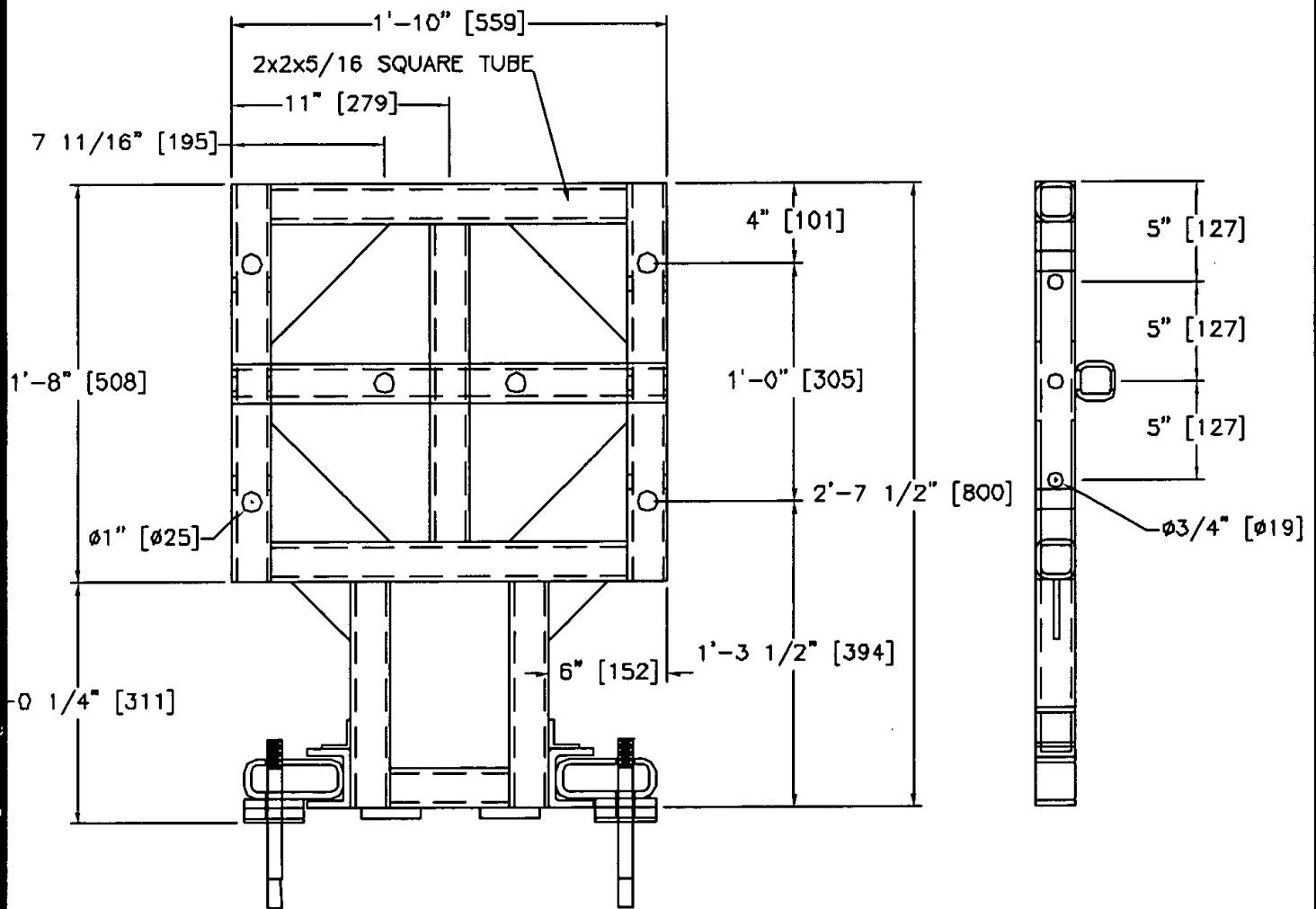
Sheet No.
1 of 3



#10 DIAPHRAM

The Texas A&M University System

| Revisions | | | TEXAS TRANSPORTATION INSTITUTE COLLEGE STATION, TEXAS 77843 | | | |
|------------------|------|----|--|---------------------|----------|-------|
| No. | Date | By | Project No. | Date | Drawn By | Scale |
| 1. | | | 220581 | 07/01 | BAS | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| DIAPHRAM DETAILS | | | | Sheet No. 2 of 3 | | |



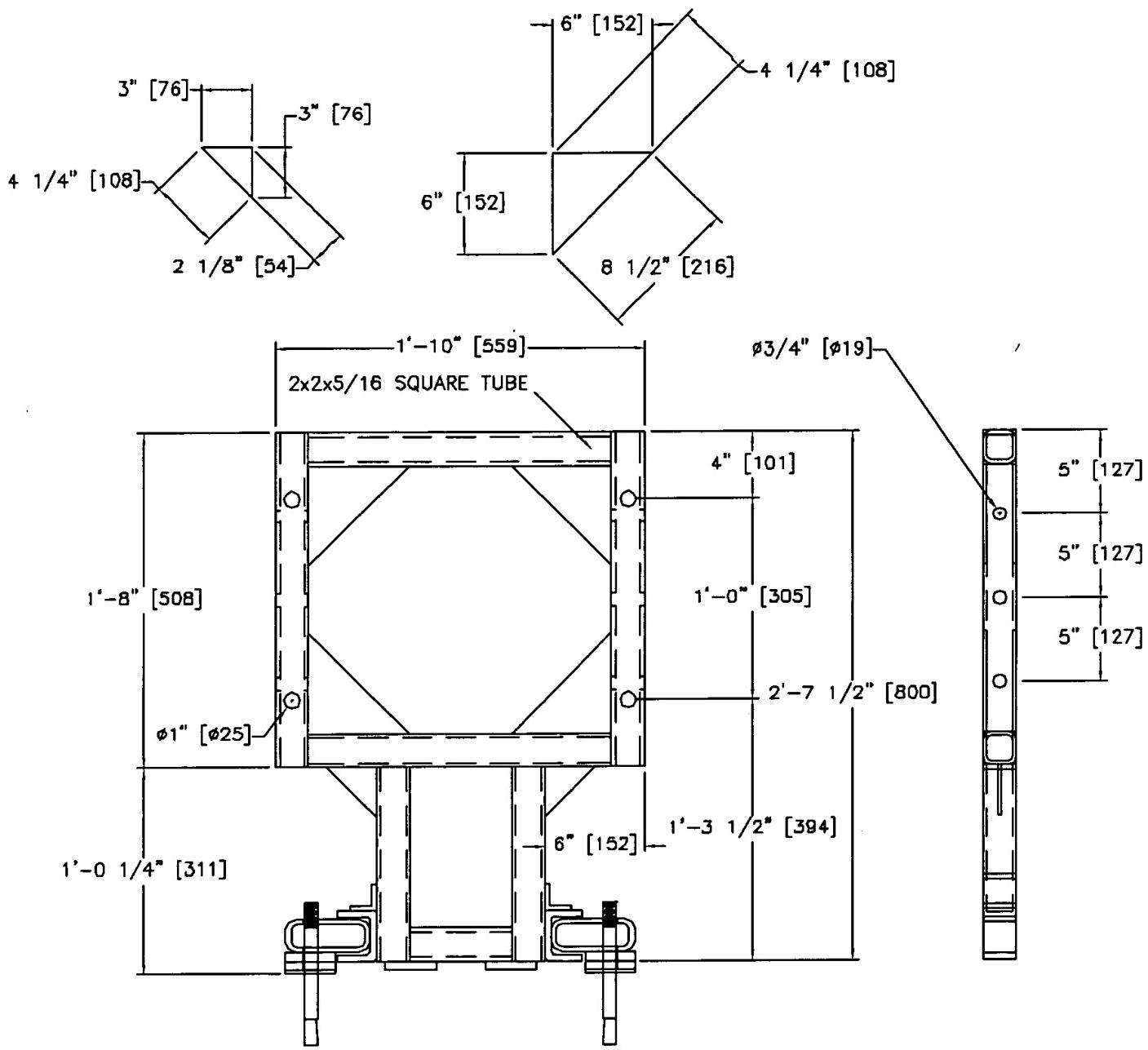
#3 DIAPHRAM

The Texas A&M University System

| Revisions | | | TEXAS TRANSPORTATION INSTITUTE COLLEGE STATION, TEXAS 77843 | | | |
|-----------|------|----|--|-------|----------|-------|
| No. | Date | By | Project No. | Date | Drawn By | Scale |
| 1. | | | 220581 | 07/01 | BAS | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |

DIAPHRAM DETAILS

Sheet No.
1 of 3



NO BOTTOM GUSSETS ON #2 DIAPHRAM

#2,4-9 DIAPHRAMS

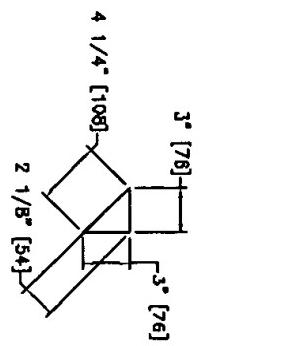
The Texas A&M University System

| Revisions | | | TEXAS TRANSPORTATION INSTITUTE COLLEGE STATION, TEXAS 77843 | | | |
|-----------|------|----|--|-------|----------|-------|
| No. | Date | By | Project No. | Date | Drawn By | Scale |
| 1. | | | 220581 | 07/01 | BAS | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |

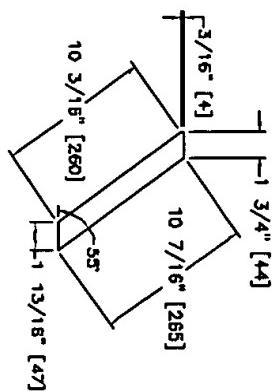
DIAPHRAM DETAILS

Sheet No.
3 of 3

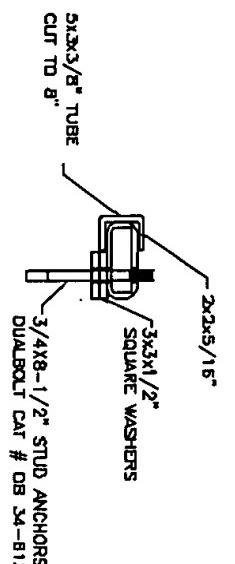
EXHIBIT E



① WEDGE DETAIL 1/4" THICKNESS

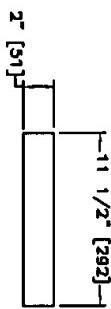
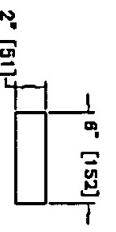


② WEDGE DETAIL 1/4" THICKNESS



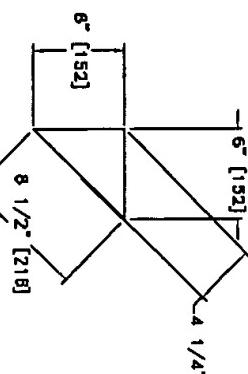
⑤ BASE BRACKET DETAIL

⑥ 2" x 2" x $\frac{5}{16}$ " SQUARE TUBE

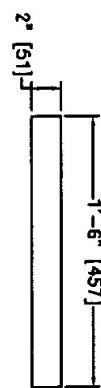


⑦ 2" x 2" x $\frac{5}{16}$ " SQUARE TUBE

⑧ 2" x 2" x $\frac{5}{16}$ " SQUARE TUBE



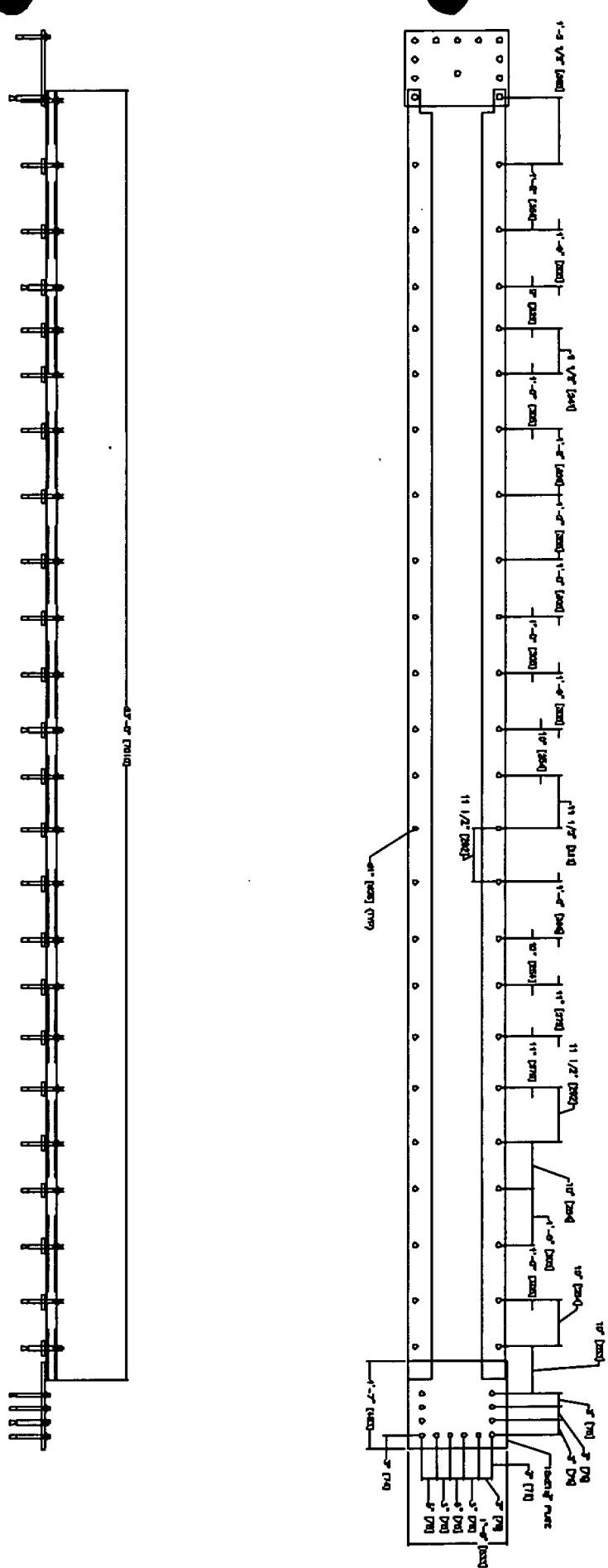
③ 2" x 2" x $\frac{5}{16}$ " SQUARE TUBE

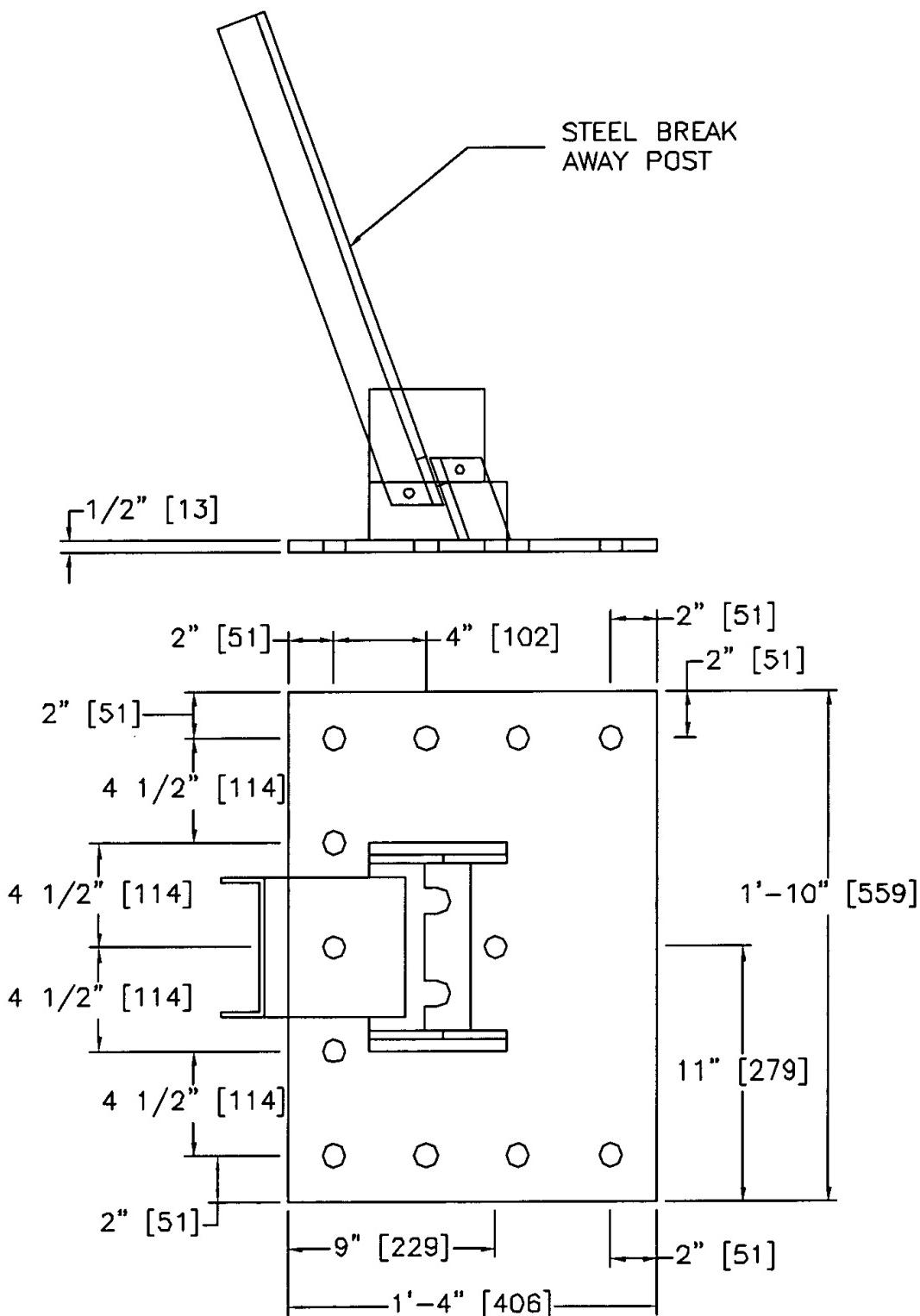


| The Texas A&M University System | | | | | |
|---------------------------------|-----------------------|---------------|----------------------------------|-------------|---------------------|
| Revisions No. | | | | | |
| Date 10/01 | | | | | |
| 1. | 2. | 3. | 4. | 5. | 6. |
| CRIM | Project No. 220581 | Date 11/01 | Dept By CRIM | Scale 1" | Sheet No. 1 of 1 |
| | | | Title EMERGENCY CRASH CUSHION | | |

| The Texas A&M University System | | | | | | |
|---------------------------------|----------|-----|--|--|--|--|
| Revision | Date | By | TEXAS TRANSPORTATION INSTITUTE COLLEGE STATION, TEXAS 77843 | | | |
| 1. | 12/11/01 | BUS | | | | |
| 2. | 12/12/01 | BUS | | | | |
| 3. | 12/20/01 | BUS | | | | |
| 4. | | | Title | | | |
| 5. | | | BOLT PLACEMENT | | | |
| | | | Sheet No. | | | |
| | | | 1 of 1 | | | |

Rev. 24 - 2002 - 11:32am





The Texas A&M University System

| Revisions | | | TEXAS TRANSPORTATION INSTITUTE COLLEGE STATION, TEXAS 77843 | | | |
|-----------|------|----|--|-------|----------|-------|
| No. | Date | By | Project No. | Date | Drawn By | Scale |
| 1. | | | 220581 | 07/01 | BAS | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |

STEEL BREAKAWAY POST

Sheet No.
1 of 2